Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, DC 20554

In the Matter of:

Inquiry Regarding Carrier Current Systems, including Broadband over Power Line Systems	**ET Docket 03-104**

To: The Commission

REPLY COMMENTS OF RAY SOIFER

Ray Soifer hereby respectfully submits his reply to comments filed in response to the *Notice of Inquiry* (the *"NOI"*) issued by the Commission in the above-captioned proceeding.

1. Taken together, several of the comments submitted raise the strong possibility that BPL in portions of the HF and lower VHF spectrum would result in harmful interference to Federal Government users with homeland security responsibilities. That is of concern to all Americans, not only to radio amateurs.

2. The National Telecommunications and Information Administration ("NTIA") notes the present lack of measurements and analyses showing that any resulting interference to allocated services would be at acceptable levels. Among the concerns that NTIA raises is that "the proposed pole-mounted interface devices and outdoor power lines used for BPL could be located close to public safety mobile and base station receivers operating in the 30-50 MHz frequency range and consequently many of the intervening signal paths would be

unobstructed." "The unobstructed and ubiquitous nature of this BPL application, and perhaps other aspects of BPL," NTIA goes on to say, "differs considerably from the situations presently found in typical unintentional radiators authorized under the Commission's Part 15 rules."

3. While noting that amateur fixed and mobile stations in the 28-29.7 and 50-54 MHz bands would be subject to similar interference from BPL, and sharing NTIA's concern with respect to that frequency range, I would emphasize that these are far from the only HF and VHF frequencies where such problems are likely to exist.

4. In RM-10209, ARRL, the National Association for Amateur Radio, ("ARRL") asked the Commission to allocate a new amateur band at 5250-5400 kHz. The Commission, in its *Report and Order*, cited objections filed by NTIA in its Comments in that proceeding, including NTIA's observation "that this band is extensively used by federal agencies, and that they need immediate access to these HF frequencies in times of emergency"[1]. In its decision allocating five specific, narrow channels to the amateur service on a secondary basis rather than the full band requested by ARRL, the Commission stated: "We believe that frequencies in the 5250-5400 kHz range may be useful for completing disaster communications links at times when the 3 and 7 MHz bands are not available due to ionospheric conditions, and appreciate the desire of the amateur radio community to assist with disaster communications. *At the same time, since the majority of the affected users are Federal*

Government licensees with homeland security responsibilities, we give considerable weight to the concerns NTIA has expressed about the potential for interference to these users. Thus, we conclude that it is not reasonable to grant ARRL's original request...."[2] [emphasis supplied]

5. In addition to restricting amateur operation to five narrow channels which NTIA had determined were "lightly used" by government agencies, the Commission ordered that amateur stations using these channels be limited to 50 W PEP transmitter output power into an antenna with a gain of 0 dBd, in order to decrease the interference potential between amateur stations and Federal Government users[3].

6. Also in its *Report and Order* in RM-10209, the Commission denied requests from broadband PLC interests to delay action in authorizing amateur operation in the 5 MHz region. "Because these new PLC systems are still in development we expect that they can be designed to be compatible with other operations in this band, and we deny the UPLC and PLCA request to delay action on this proceeding"[4].

7. Although I support NTIA's request for additional testing of BPL interference levels, the calculations in ARRL's Comments in the present proceeding suggest strongly that the Commission's expectation, in the section of its *Report and Order* in RM-10209 cited in the previous paragraph, is likely to prove extremely optimistic. ARRL clearly shows

---

[1] *Report and Order*, at 29.
[2] *Ibid*., at 31.
[3] *Ibid.*
[4] *Ibid.*, at 32.

that the likely received signal levels from BPL in the 3.5 and 14 MHz bands will greatly exceed those from typical amateur radio stations under normal propagation conditions. The same situation is likely to prevail at 5 MHz as well.

8. If concern over interference from amateur stations to federal licensees with responsibility for homeland security led the Commission to take the action it did in RM-10209, ARRL's calculations demonstrate that, *a fortiori*, the potential for interference to homeland security and other emergency communications in the 5 MHz and other HF and VHF bands from BPL is far greater, because the received signal levels from BPL are that much stronger than those from amateur stations.

9. One of BPL's inherent weaknesses, in an emergency situation, is that electric power, and power lines themselves, are frequently among the first services to fail. In such an event, BPL users would lose their Internet access perhaps when it is needed most. However, an emergency communications transmitter, whether government or amateur, perhaps operating on a temporary antenna, would still face the difficulty of being heard and understood through receivers located in areas not affected by the emergency, which still have electric power, and thus are subject to BPL interference. In an emergency, then, BPL could well turn out to be a "lose-lose" situation: causing harmful interference to out-of-area stations which otherwise may be in a position to assist, while being unable to

provide Internet access and networking capability to those in need within the affected areas.

10. The Central States VHF Society ("CSVHFS") points out that harmful interference from BPL would likely extend well above the actual frequencies employed for this purpose, due to the generation and radiation of harmonics well into the UHF and even microwave bands[5]. I am seriously concerned about the effects of this interference on the very weak downlink signals from amateur radio satellites in the 144-146, 435-438, 2400-2450 MHz and higher amateur-satellite service bands, and the even weaker signals from earth-moon-earth, meteor scatter and long-haul tropospheric paths in use by amateurs at these and other UHF frequencies.

11. The generation and radiation of harmonics could result in harmful interference to essential public safety communications at frequencies well above those actually employed for BPL. Second and third harmonics of BPL emissions may pose a danger to police, fire and ambulance communications at 148-174 MHz, similar to that cited by NTIA at 30-50 MHz.

12. Aeronautical navigation at 108-117.975 MHz, and aeronautical mobile at 117.975-137 MHz, are especially vulnerable to interference caused by second and third harmonics of BPL emissions,

[5] As a member of CSVHFS, I should point out that the society includes some of the nation's leading professional RF engineers and broadband system designers, many of whom participated in the formulation of its position. For example, the CSVHFS board member who signed and submitted its Comments in this proceeding, Mr. Owen Wormser, is in his professional capacity the Principal Director for Spectrum, Space, Sensors and C^3I in the Office of the Assistant Secretary of Defense (C^3I). Mr. Wormser was, of course, speaking for CSVHFS and not for DoD.

because they employ amplitude modulation (AM). The need to assure public safety argues strongly for a full program of tests, as called for by NTIA and ARRL, before moving ahead with the deployment of BPL.

13. I concur with the analysis and conclusions presented by the Radio Amateur Satellite Corporation ("AMSAT"). AMSAT presently has a satellite under construction for expected launch in 2004, AMSAT-OSCAR-E, that will fly a multi-mode uplink receiver in the 28-29.7 MHz band. Interference from a large number of BPL emitters on the ground could well render this uplink unusable.

14. With respect to downlinks, Bruce Paige ("Paige") observes that to assume a distance of 30 meters (approximately 98 feet) between the BPL emitter and the amateur station's receiving antenna would frequently be erroneous. In Paige's case, this distance is only about 10 feet (approximately 3 meters), and the strength of BPL interference would be correspondingly greater. I submit that Paige is far from the only U.S. amateur licensee in a similar situation. As population density increases, the interference potential from BPL can only grow.

15. In view of these concerns, and others expressed in my original Comments, I agree with ARRL that BPL is a Pandora's box of unprecedented proportions. The foregoing considered, I join ARRL in respectfully requesting that the Commission take no steps to permit access or in-building BPL at HF or VHF at this time.

RESPECTFULLY SUBMITTED,

/S/ RAY SOIFER

Ray Soifer

60 Waldron Avenue

Glen Rock, New Jersey 07452-2831

Telephone: (201) 444-3111

Fax (201): 447-5472

E-mail: ray@soiferconsulting.com

August 20, 2003

In accordance with §1.405 of the Commission's Rules, copies have been served upon:

ARRL, the National Association for Amateur Radio

Central States VHF Society

National Telecommunications and Information Administration

Bruce Paige

Radio Amateur Satellite Corporation